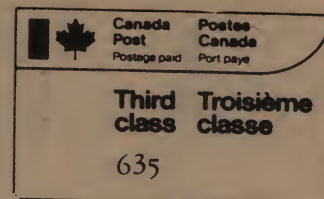




the Ring



"When the aborigines sighted Captain Cook's ships, they ignored them because they knew such things could not exist. It's the next best thing to being invisible."

—Margaret Atwood, *Life Before Man*

UNIVERSITY OF VICTORIA

Volume 6, Number 25, October 24, 1980



Why is this man smiling? See page 11 to find out. Senior physics lab instructor Don Stenton is one of many UVic contributors involved in Discovery Fair in Vancouver, an exhibition of science, communications, technology and inventions at the Robson Square Media Centre Oct. 27 to Nov. 5. Sponsored by the Ministry of Universities, Science and Communications, the fair is open and free to the public. Among the exhibitors are the three British Columbia universities, British Columbia Institute of Technology, B.C. Research, the Science Council, and many branches of government and industry. UVic exhibits are planned around science education in the community, hypothermia research, research into coal liquefaction and quality, Discovery Park projects and biophysics research which has resulted in the invention of a new heart valve. This special science issue of the Ring features stories on these and other research projects happening on campus.

Petch promotes urban conference

Students who wish to attend Victoria's First Urban Conference on Oct. 29 but find the \$25 registration too high will get a special subsidy from UVic President Dr. Howard Petch. He says up to 50 student registrations will be made available at \$10. Interested students should contact Dr. Gerry Walter (Assistant Dean of Arts and Science) at local 6601.

A free public lecture by Benjamin Thompson, world-renowned former professor of architecture at the Harvard School of Design and designer of food shopping areas similar to Les Halles in Paris will be given in the evening of the conference day.

Petch is chairing the all-day event to be held at the Empress Hotel, beginning at 8 a.m. Participants include Dr. Harry Foster (Geography), City of Victoria and Capital Regional District representatives, developer Sam Bawlf, and Victoria MLA Charles Barber. Dr. Herb Auerbach, a consultant on how to revive city cores and a member of Ottawa's National Capital Commission will also attend.

The conference will break into group sessions in the afternoon to discuss the issues raised in the morning presentations. The conference has been organized by Monday Magazine.

Solar heat, buildings, in Five Year Plan



Solar heat for McKinnon?

A new building for Nursing, Social Work and Child Care, major alterations to the Cornett building, and a solar heating project for the McKinnon building are among the 10 items for which UVic will seek funding from the provincial government in the 1981-82 fiscal year. The items are listed in UVic's Five Year Capital Plan, details of which were approved by the Board of Governors at its Oct. 20 meeting for submission to the Universities Council of British Columbia (UCBC).

Also included in the plan, for the 1984-85 fiscal year, is a \$3,600,000 Visual Arts building.

The Five Year Plan submission to UCBC is required as part of the procedure for financing capital expenditures at UVic by the British Columbia Educational Institutions Capital Financing Authority, which provides long term financing for B.C. universities.

The proposed \$550,000 expansion of the Cornett building is a major new addition to the five year plan. The expansion will join two of the existing wings of the Cornett building, adding 5,718 square feet of space of space.

In the long term this additional space will be used by the social sciences departments already housed in Cornett. Initially, the additional space would go to relieve expected crowding problems in the Schools of Nursing, Social Work and Child Care of the Human and Social Development Faculty, currently located in the Sedgewick building.

The long term needs of the schools

would be met by a \$7,727,100 Nursing, Social Work and Child Care building for which a detailed project requirement study will be completed by 1981. Approval will be sought at that time for authority to proceed with pre-construction design work, in order for construction to start in 1983 for completion not later than the fall of 1984.

In reply to a question at the BOG meeting from Sonia Birch-Jones (Public Administration) regarding the failure to include the School of Public Administration in the proposed building for the Faculty of Human and Social Development, UVic president Dr. Howard Petch said he is not sure it is the best location for the program.

"It will make a big difference if we develop a School of Business Administration or Commerce. In the long run we may have a Faculty of Administrative Studies. I'm just not sure and we don't want to tie down Public Administration to a building at this time. In a year we should know."

The \$250,000 solar heating project at the McKinnon building proposed in the Five Year Plan would provide heated water for the pool and other uses. UVic will contribute \$90,000 with other funding to come from government sources.

UVic Vice-president (Finance) Bob McQueen noted that while the Finance Authority procedures call for a "rolling" five year plan, there has been no indication to date of government acceptance or rejection of proposed capital expenditures beyond the initial five year period of 1977-1982.

Health Information program approved for UVic

Health Information Science, the first program of its kind in Canada, has been approved for establishment at UVic by the University Council of British Columbia.

A director will be appointed in June, 1981 to develop a program for approval by Senate with the aim of admitting the first students in September 1982, says UVic's Academic Vice-President Dr. Alfred Fischer. The first year's intake is expected to be about 30 students.

The program, which will produce graduates employable as health records administrators, has been established in response to the need for professionals with an understanding of computer based records and analytical systems. It will become part of UVic's Faculty of Human and Social Development.

The role of the health records administrator, as outlined in a study for UCBC noting the need for the program, would involve the design, development and directing of health record systems within hospitals and other

health related institutions.

This role could also include the design and development of integrated health information systems for health care institutions, the development of indices of specific health problems for research in statistical material evaluating health care.

The role of the health record administrator could also extend to that of "neutral guardian" of records, ensuring compliance with all legal requirements concerning health records which arise in the management of this type of information.

The program may also consider the training of administrators to perform system analyses and research focussing on the interrelationship of health-related statistics and of health care utilization in relation to demography, epidemics and public health.



TRIUMF REPORT

Information for the following report was supplied by UVic physicist Dr. Gren Mason, one of some 25 UVic scientists who have played a part in the growth of TRIUMF, the \$36 million cyclotron located on the University of British Columbia campus. UVic scientists at TRIUMF are engaged in some of the world's most advanced research in intermediate energy physics

UVic's 'suitcase physicists' have been particularly busy since July, travelling back and forth from the campus to the mainland to conduct three experiments involving subnuclear particles, at the Tri-University Meson Facility (TRIUMF) cyclotron at the University of British Columbia.

The particles in question — pions, muons and neutrinos — decay at mind-boggling rates, but are still detectable using techniques that have become almost standard to TRIUMF experimenters.

One of the experiments is examining the decay rate of pions, which usually decay into muons and neutrinos. But occasionally, about twice in 10,000 times, the decay process creates instead an electron and a neutrino.

Rather sophisticated theories predict the fraction of times that pions decay into electrons and neutrinos rather than muons and neutrinos. However, the best prediction doesn't quite agree with the results of equally sophisticated experiments performed first 20 years ago at the University of Chicago and more recently at TRIUMF.

UVic scientist at TRIUMF, Dr. Doug Bryman and colleagues from UVic, including Dr. Charles Picciotto, have for five years been attempting to improve the precision of the experimental value. If successful, their experimental results, if they differ from the results predicted by theory, could mean a re-evaluation of some of the basic ideas on the theory of matter.

The experimental apparatus for their work conjures up the archetypal scientific experiment, centering on a very large crystal of sodium iodide to detect the high-energy electrons from the pion decay, and a multitude of 'state of the art' electronic modules interconnected by wires, an on-line computer, magnetic tape units and visual display terminals.

Another UVic experiment at TRIUMF involves stopping negatively charged muons in a number of different targets selected from throughout the periodic table, and measuring the resulting muonic X-ray intensities.

Negative muons go through a series of energy levels after being stopped at the targets, before settling into what is called the ground state. The experiment measures the intensities of X-ray emitted by the decaying muon. Although physicists believe it should be possible to use a certain theory to predict the muon's behaviour, there are discrepancies between the theory and behaviour. The UVic scientists hope, with this experiment, to resolve the differences.

The 57 elemental targets used during the experiment have been provided by Dr. Clyde Wiegand of the Lawrence Berkely Laboratory in California. The enormous amounts of data being collected are being analyzed at UVic.



Dr. Doug Bryman (left) explains the muon to electron conversion experiment at TRIUMF to Prince Charles during his April 1 tour of the cyclotron site in Vancouver. They are accompanied by TRIUMF director Dr. Jack Sample (right).

The third experiment being conducted currently at TRIUMF is the most recent in a series being carried out by the UVic group to study the very strong interactions of pions in the atomic nuclei, using X-rays.

The series was started by the late Dr. Michael Pearce with the support of UVic physicists Dr. Art Olin, Dr. Gren Mason and Dr. George Beer.

Because of the strong forces interacting on negative pions, they seldom get to the lowest stable orbit in pionic atoms before being annihilated.

The material used in the experiments is the simplest nucleus of deuterium which can form an "exotic" atom by combining

with a pion. Although the pionic atom is one of the simplest in structure it is also one of the most difficult to work with, because the X-rays it produces, which must be observed to get the required data, exist in a 'no man's land' where most detectors do not work well. Also the X-ray energies are low, and the stopping target of deuterium must be extremely thin to allow the X-rays to get out of the deuterium and into a detector. Thus, the pion stopping rate is unusually low and the experiment must be run for an extended period of time before enough data is accumulated to gather meaningful results.

'Amber light' for engineering?

The Faculty of Arts and Science is "at present" opposed to the establishment of a Faculty of Engineering at UVic.

By a vote of 66 to 60, Oct. 17, faculty members in Arts and Science approved an amended motion from Dr. Roger Beehler (Philosophy) opposing a proposal for an engineering school.

Beehler's motion was amended to include the words, "at present".

Dr. John Money, Dean of Arts and Science, personally interprets the vote in Arts and Science as "an amber light" for the UVic administration which has developed the engineering proposal.

"I don't think the administration has been given a red light or a green light on the project," said Money. "I would think that UVic could feel its way cautiously ahead on the proposal."

The proposal to establish an engineering faculty with 950 students and 50 faculty members has been sent to all faculties on campus.

Three faculties have now voted in oppo-

sition to the proposal, including Fine Arts, Graduate Studies and Arts and Science.

The Faculty of Education did not take a vote on the proposal but Dr. Bruce Howe, Associate Dean of Education, has been asked to prepare a brief outlining opinions of concern and support from Education faculty members.

Recommendations and reports from all faculties are scheduled to be presented at the Nov. 5 meeting of the Senate. The Universities Council of British Columbia (UCBC) has asked for proposals for engineering from the three universities by Jan. 15, 1981.

After the meeting of Arts and Science, Beehler said he was disappointed that his original motion calling for unqualified opposition to an engineering faculty at UVic was "weakened" by the amendment.

"However, the motion might not have passed in its original form," he said.

Money said the proposal was the subject of a long debate at the meeting and the outcome did not surprise him.

UVic tops 9,000

At the end of September, total enrolment at UVic had nudged over the 9,000 mark for the first time.

There are 9,004 students enrolled this year, an increase of 9.47 per cent over a total enrolment of 8,530 students at the same time in 1979.

The most spectacular increase is at the graduate level where 855 students have enrolled, an increase of 23.2 per cent from 1979.

At the end of September there were 8,149 students enrolled in undergraduate courses and in the School of Public Administration and the Faculty of Law. This is 313 more students than in 1979, an increase of four per cent.

Of these 8,149 students, 5,612 are full-time while 2,537 are part-time students. The switch from full-time to part-time enrolment continues with 31.1 per cent of students now registered in less than 12 units of courses.

Full-time enrolment in Fine Arts is up by 5.8 per cent and there is an increase of 1.4 per cent in enrolment in Human and Social Development. Law has registered 230 students, an increase of 16.2 per cent from last year, reflecting a larger first-year class.

How big?

President Dr. Howard Petch wants to see UVic grow gradually to an enrolment of about 10,000 full-time students and no larger.

Petch was asked at a question-and-answer session Oct. 10 what he sees as the ultimate size of the university.

"I think 10,000 (full-time equivalent) students would be the ideal size," he replied. "This would enable the university to take advantage of the economies of scale without losing the advantages we now have as a smaller institution. With any more than 10,000 students, we would lose these advantages."

Advantages Petch was referring to include personal contact between professors and students and inter-relationships between all departments on campus.

Petch predicted that UVic's enrolment increases would drop off for the next few years to about two per cent a year, and then begin to increase again at a more rapid rate.

He was asked the question about the optimum size of UVic at a meeting with faculty members in Arts and Science about a proposed Faculty of Engineering which would add 950 students to UVic.

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Will B.C. open its coffers to heart team?

Substantial funding is needed to continue testing what could be the most effective artificial heart valve yet invented for use in heart valve replacement surgery. The funds must come from this province if the final testing and manufacturing of the valve is to remain in British Columbia.

The valve in question is a bicuspid or two-leaflet treated animal tissue valve, which efficiently emulates the action of the mitral or inlet valve in the left ventricle of the human heart.

It has been designed in Victoria by UVic physics research assistant Larry Scotten and UVic physics doctoral graduate Dr. David Walker, working on a research project instigated by Dr. Richard Brownlee, the Royal Jubilee Hospital's director of cardiac surgery. UVic has been a continuing collaborator with the Royal Jubilee Hospital on this and other projects.

The research team was turned down early this month on their application to the B.C. Science Council for a grant of \$500,000 to proceed with fatigue and animal testing.

Money from donations will cover the researchers' salaries for a few months more, but donations or funds from agencies could not be expected to completely cover the multi-thousands of dollars needed in future to completely test the valve and possibly bring it to the marketplace in British Columbia.

The application to the Science Council appears to have been turned down not on the basis of the quality of the development of the heart valve, but out of a concern that its manufacture might ultimately take place outside of B.C.

The Science Council is willing to make grants only if it is reasonably assured that development and manufacture of an invention will be done in B.C. Since companies that might manufacture the heart valve are not located in B.C. the Council is understandably not prepared to give the project a large grant.

However, money of the magnitude necessary to get the heart valve properly tested and manufactured would probably have to come either from the Science Council, or from a new private company.

The manufacturing required is delicate and extremely small and clean, of the type that has been discussed for a Discovery Park.

To manufacture the new heart valve in British Columbia would be a first not only for the province, but for Canada. There are no artificial heart valves of any type being manufactured in this country. They are now being made primarily in the United States, Denmark and Brazil.

There is nothing inherently difficult about the manufacture of the valve that would prevent them from being manufactured in this province if the project were properly funded, according to Scotten.

"The only reason it couldn't be done in Victoria or British Columbia is that there's nobody here at the moment with experience in putting them together on a production scale. They could be made like widgets, if people were properly trained to make them."

Work on the valve up to this point has taken place mainly in a small lab at the Royal Jubilee Hospital. It began in Great Britain more than 10 years ago with Brownlee's co-invention of a potentially promising valve that needed refinements. Scotten joined the project in 1974 and Walker two years later.

The testing now required to see how the valve would resist mechanical fatigue could be carried out in the same lab, and the animal testing using calves which would undergo heart valve implants could be done at the Royal Jubilee as well, Scotten says. The proposal to the Science Council was to do animal and fatigue tests concurrently with the animal implants over a three-year period.

Designing a better artificial heart valve has been the aim of numerous researchers around the world ever since the first valve implant was performed more than 20 years ago. More than 50 different types of devices to replace natural human valves when they deteriorate have been devised, but none have been without certain drawbacks.

It was a major step when the team, a year ago, brought their newly-designed bicuspid valve to the fatigue and animal testing stage. All bioprosthetic mitral valves commercially available are tricuspid. But, the human mitral valve is approximately bicuspid. It is almost impossible to duplicate exactly, and resembles an opening and closing veil of cloth draped from an annulus.

The researchers new replacement mitral valve is made in part from the pericardium of a calf, seals absolutely when closed and opens about 50 per cent more than the best existing tissue type valves now in use, giving minimal obstruction to blood flow. It also gives superior performance compared to other valves tested and now on the marketplace in terms of total transvalvular energy loss.

Now at the animal and fatigue testing stage, two years earlier than anticipated, the researchers have been developing a prototype fatigue tester as well as testing other valves sent to them by manufacturers. They are conducting this testing service with a mechanical heart simulator Scotten constructed and a UVic camera which can take pictures of valve movements at the rate of 400 a second.



Heart valve: will it remain in B.C.?

In return for testing services, they have received for study purposes donations of numerous valves which would have cost \$1,000 or more each on the market. This year, Scotten has been working in the lab with UVic physics co-op students Allen Nugent and Robert Racca. Walker, who has been on sabbatical in Australia since Christmas, will be returning to the project in January.

Scotten is taking a pragmatic approach to the hiatus in funding for the heart valve project, stating that "Now, probably for the first time in many months, we might have time to refine the valve design even more. I imagine if we find the money next year, we might get the fatigue and animal testing done as quickly as we want."

Much of the valve's construction is handcrafted at this point, he says, and it is important to set up guidelines "as mathematically as possible" which could be followed by manufacturers. The intent would be to develop guidelines for the exact shape the valve is to take for a range of different sizes.

The other project which the researchers are turning their attention to is improving the prototype fatigue tester they have developed. Their design is a modification of the Sheffield fatigue tester made in England, which is the only one commercially available, at a cost of approximately \$2,000 for every valve tested. Scotten's guesstimate of the cost of their model, when completed, is around \$600 per valve tested.

"If we get some money, we'll fatigue test 16 of the bicuspid valves and 16 each of the commercially-available tissue valves," says Scotten.

However, once the new fatigue tester is ready to be put to use, the Victoria researchers will no longer be able to rely on donated valves from manufacturers to test and compare with their own.

The valves for comparative testing will have to be bought on the marketplace, at prices ranging from approximately \$1,200 to \$1,500 each, to ensure that they are of clinical quality and haven't been rejected by their manufacturers.

The Victoria team has also developed their own ideas on how fatigue testing should be conducted. Other tissue valve manufacturers don't publish data on their fatigue testing, and, among other factors, Scotten believes valves are now being tested at excessive cycle rates.



Scotten (left) and Racca examine fatigue tester

Co-op broadens student's horizons

Becoming involved in research on a new heart valve through the UVic physics co-op program has helped student Robert Racca (A&S-4) discover the direction his studies will take in future.

Racca was interviewed recently in the cardiac development lab at the Royal Jubilee Hospital in Victoria where he and UVic physics research assistant Larry Scotten are developing a new artificial heart valve and fatigue tester (see story this page).

"I am really pleased with the co-op program. It has helped me to discover my interests. The field of medical physics is so interesting that I am thinking of going into it," says Racca, who is now entering his second work term with the heart valve project, and his fourth work term as a UVic co-op student.

He is one of 283 students at UVic now enrolled in co-op programs through the departments of Physics, Chemistry, Computer Science, Creative Writing, Mathematics, Geography and the School of Public Administration.

Students in co-op alternate their academic studies on campus with work terms in government, industry and other areas where co-op employers provide jobs at regular salaries in the students' fields of study. Students receive academic credit for their work terms performance.

Blood needed

UVic has a long history as a reliable source of blood for the Red Cross.

Faculty, staff and students have an opportunity to continue the tradition at a three-day blood donor clinic Oct. 28, 29 and 30 in the Student Union Building, from 10 a.m. to 4 p.m.

In 1979 clinics at UVic accounted for 13 per cent of the the blood collected on the south end of Vancouver Island. Over the past five years the Red Cross has recorded almost 10,000 blood donations at clinics sponsored by UVic.

The blood collected is used in open-heart and lung surgery and to assist those afflicted with anemia and jaundice. It puts young hemophiliacs back on their feet, saves the lives of accident victims and helps to heal burns of scald victims and firemen.

The Red Cross reports that 7,200 blood

donors are needed every week in British Columbia to look after the needs of hospitals. Victoria, alone, needs an anticipated 16,500 donors in 1980, an average of 45 donors a day.

While donors are inside the SUB Oct. 28 and 29, Saanich police will be outside, providing free registration of bicycles.

The Alma Mater Society and the office of Traffic and Security on campus are urging students to bring their bicycles to the SUB between 10 a.m. and 3 p.m. to have them registered.

The Saanich police are offering free registration of bicycles on campus as a service during a crime prevention display. The police will have a trailer in front of the SUB Oct. 28 and 29 and pamphlets on crime prevention will be available.

Team gets \$38,000 Explorations grant for mainstreaming film



Potter: "It really is enough to make a film!"

A \$38,000 Canada Council Exploration grant has been made to a UVic professor, a Vancouver educator, and a film editor to make a half-hour 16mm color documentary film about mainstreaming children with visual handicaps into the regular public school system.

The grant was awarded last week to Dr. Geoffrey Potter (Education) to act as executive director of the film which he will make with director and specialist in special education Marie Dreiser, and producer and National Film Board editor Christl Harvey, both of Vancouver.

It is the largest Explorations grant awarded to date. The amount is sufficient to underwrite the entire cost of making the film this winter in Vancouver.

The film will be the first educational support material made in Canada to provide information and a basis for discussion about mainstreaming for people involved in this recent and sometimes controversial innovation in Canadian education.

"I am delighted. Getting money to make films is extremely difficult, and I feel particularly fortunate. This really is enough to make a film without having to ask for favors from anybody," says Potter, whose interests and

research areas include mass media, educational technology, distance education, alternative schools, and the impact of using technology in the education of physically-handicapped children and adults.

Mainstreaming, he explains, began in the United States about six years ago and has been recommended to school districts by the B.C. government for the past two to three years, partly as an outcome of the publication in 1975 of the Berger Royal Commission on Family and Children's Law. Part four of the fifth report, "Special Needs of Special Children", espoused the benefits of integration of children with special needs into the regular school program whenever possible.

The B.C. Ministry of Education cited the Berger Commission as support for its decision to close Jericho Hill School for the Blind. Since then all visually-impaired B.C. children have been attending public schools.

Mainstreaming in B.C. seems to be working but is still "fraught with suspicion" says Potter. "A lot of educating needs to be done. Many people still have a common misconception that the physically-handicapped are retarded."

Many people concerned with mainstreaming, including educators and parents of children with and without physical handicaps, have fears which could be alleviated partly by a film exploring the issues involved and providing a platform for discussion, he feels.

Teachers, worrying that they will not be able to adapt the curriculum to include a handicapped child, often raise questions such as 'Won't he hurt himself in the gym? What can she do when we use equipment such as microscopes or when we watch films? What can I expect in terms of academic performance?'

Parents of children with handicaps may worry that their child will not be understood, and parents of children without handicaps may worry that their children's academic progress will be slowed because the handicapped children may take up large portions of the teacher's time.

The film will identify the special educational needs of visually-impaired children, and explore some of the problems and possible solutions to their social integration into public schools.

It will depict different models for mainstreaming, including full-time special class attendance, part-time attendance and full time integration into the regular classroom. The role of the teachers aid and specialist in helping to instruct the handicapped in the classroom will be shown, and technical aids such as talking calculators, brailers, television readers and magnification devices will be demonstrated by partially sighted and totally blind students.

The filmmakers will conduct interviews with teachers, parents, visually-handicapped students and their peers and will highlight activities that blind people can participate in, rather than focussing on their disabilities. One successfully integrated and totally blind student described by Potter is able to swim, skate, play piano and cross country ski.

Another area of concern to the filmmakers is social interaction. Since many visually impaired children aren't able to observe ways of expressing sociability and friendliness such as smiling, they may be misunderstood by their peers who may then tease, ignore or be overly solicitous towards them.

The film will explore social interaction by speaking to students, their peers, educators and parents about ways of developing understanding between the sighted and visually-handicapped population, Potter says.

It will be distributed both provincially and nationally through the Canadian National Institute for the Blind, the B.C. Provincial Educational Media Centre, and will also be made available through universities and cablevision stations.

'Box' opens season

Two women in a boxing ring are the main attraction in Sheldon Rosen's one-act play, *The Box*, to be performed at 12:30 p.m. Monday through Friday (Oct. 27 to 31) in the 'L' Hut Studio.

The Box is the opening entry in the Phoenix Theatre's 1980-81 season which features two major productions and a series of lunch-hour productions.

The play deals with human conflict and the future, featuring two characters who cling to the safety of the past. Reality and the future are in a box which plays a pivotal role in the play.

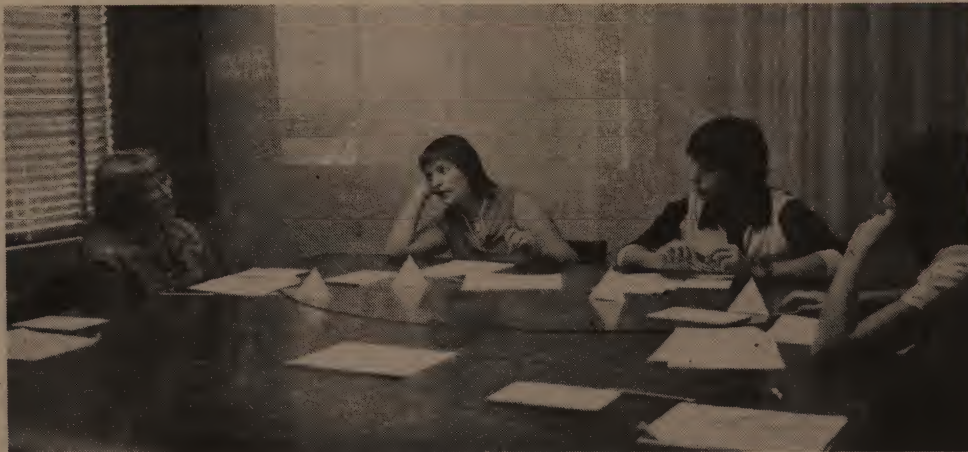
Featured are Wendy Donaldson (FA-3) and Jennifer Langley (FA-4).

Director Anton Stratford, an MA student majoring in Theatre-in-Education, explains that he chose the play because he wants to experiment with a new style.

The director feels the play is relevant to today's society. "I think we live in a box-oriented society. We live in boxes and we store our past in boxes, to look at them occasionally."

Stratford has directed plays both as an undergraduate student and as artistic director of the Yellowpoint Drama Group in Nanaimo. He is one of three students in a program introduced this year by Dr. Barbara McIntyre, chairman of the Theatre Department. UVic's graduate program in Theatre-in-Education is unique in Canada.

Mandatory retirement judged by jury



The fate of fictitious Dr. Smith of Adanac University is being decided by a jury of volunteers in the small groups lab in the Cornett Building (above) in a research project being conducted at UVic this year by Dr. Paul Baker (Sociology). Baker, whose research interests lie in both communication patterns in small groups and in the sociology of aging, has received a \$10,000 research grant from the Social Sciences and Humanities Research Council to study the dynamics of jury decision-making. He is seeking volunteers over the age of 18 to sit on six-member juries and decide whether 65-year-old Dr. Smith should be forced to retire from active teaching. Baker has developed a machine to enable himself or research assistant Zoe Walker record the jurors' interactions. The machine provides tapes which are taken to the UVic Computer Centre for analog to digital conversion, providing detailed numerical analysis of who talks to who and for how long. One of the project's aims is to discover whether six-member juries can be as effective as the traditional 12. The decisions of more than 120 volunteers have been recorded to date and Baker would like to work with at least 300 volunteer jurors by Christmas. He would be pleased to work with volunteers from the older sectors of the population. Volunteers interested in an hour or two of temporary jury duty can contact Baker in Cornett 383 or by phoning local 4797 on campus, or 477-4223.



Media and entertainment reveal a changing China

by Donna Danylehuk

Half-hearted service by clerks, ill-mannered behaviour by young people, inconsiderate neighbors, unreasonable marriage dowry demands...

These are all among the day-to-day concerns of ordinary people which can be identified in China today by scanning newspapers and journals in the world's most populated country, according to Uvic's director of Pacific and Oriental Studies, Dr. Jan Walls.

Day-to-day concerns and social problems such as using the 'back door' and personal connections to get public favors, and an 'iron rice bowl' tenured office mentality among public servants are being named and attacked in satirical pieces in the *Beijing Evening News* and other Chinese publications, Walls says.

Walls toured China last November, and observed and interviewed people about what has taken place in the country since the fall of the Gang of Four and the establishment of a governing regime dedicated to new and changing goals under the "New Hundred Flowers", a policy dedicated to "the liberation of the mind from the fetters of doctrinaire thinking."

"Really amazing" is how Walls describes changes in attitudes and freedom to express those attitudes in China today compared with behaviour observed during the Great Proletarian Cultural Revolution from 1966-76.

The attitudes and value systems being propagated, Walls explains, are important for the restructuring of the Chinese economy at every level for the purpose of increasing both quantity and quality of production.

Hundreds of millions of Chinese are being encouraged to accept the new approach to modernization and the new emphasis upon practice and experience.

"Through mass media, the most isolated peasant in the remotest parts of the country is kept aware of the latest developments in national construction policy."

"Proceed from reality and let experience be the only standard of truth."

The message is reaching the people through dozens of regional journals whose texts are studied, memorized, rehearsed and performed by thousands of ballad and storytelling troupes, professional and spare-time, in theatres, factories, schools, on radio and television programs "even on ping pong tables in remote villages without a proper stage."

Walls' research encompasses Chinese popular folk arts and mass media. His findings illuminate how new attitudes are being inculcated in the Chinese people partly through government-approved mass media and through various forms of popular entertainments.

He has presented his findings in an essay and series of translations entitled "Popular Media and Social Change: Satire and Modernisation in China Today" which he presented in the summer to the "China Education Seminar" in Toronto, sponsored by the International Development Research Centre.

Recently he appeared on Uvic's syndicated radio-tape service (see *Ringers*, this issue) and also spoke with *the Ring*.

His findings amplify recent broadcast news reports commenting on greatly increased levels of tolerance of internal criticism of Chinese government policies and practices from highly-placed bureaucrats in that country.

He points out that the ruling establishment in China has always recognized the power of the popular media to influence behaviour by providing dramatic examples of good and evil, reward and punishment, success and failure, but it was not until very recent times that the government of China actually became involved in the production of popular media.

"Slogans, the written word, even past practice which once was found successful under different conditions — none of these can replace actual practice and common sense in dealing with reality today."

The media of China today, he says, are propagating the view that a good socialist system should not attempt to deceive the world into believing that life is better than it actually is, should allow the expression of popular discontent, and should not have to rely upon secret police intimidation to control discontent.

During the years from 1966-76, the single most important criterion applied to media content was ideological purity, he says.

"No values were promoted through the popular media that did not reinforce belief in the positive, progressive, revolutionary nature of the toiling masses, and in their ability to achieve the most astounding results inspired



Walls, left, with Liang Houmin, a performer with the Beijing Ballad and Storytelling Troupe, in Liang's Beijing apartment

solely by revolutionary zeal and faith in the correctness of Marxism-Leninism-Mao Tse-tung thought."

There were no middle judgements and no middle ground:

"Revolutionary heroes were faultless and distinguished as individuals only in their extreme identification with the toiling masses, while counter-revolutionary villains were uniformly 'rotten to the core' and

"It does not matter whether it is a white cat or a black cat, as long as it can catch mice."

deserving of nothing but our utter contempt."

It is against such a background that Walls notes the striking changes in attitude evident today in the media, and in widely performed and read jokes, poems, short stories in verse, comic monologues, dialogues, allegorical tales and a distinctively Chinese form of entertainment known as the fast clappertale (bamboo castanet-type instruments which are played to accompany rhythmic verse presentations).

"In some of the best pieces of popular performed art, we see one consistent message: practice and common sense are the only reliable bases for problem solving. Slogans, the written word, even past practice which once was found successful under different conditions — none of these can replace actual practice and common sense in dealing with reality today."

One of the most important roles of the popular media in China today, he says, is to demonstrate "in an entertaining and convincing fashion that past policies and their attendant values were mistaken, while present policies are the key to successful modernization."

The standard of virtue in China today is performance, according to tales presented by such groups as the Beijing Ballad and Storytelling Troupe, which perform throughout the country.

The prevailing political line of thought that Walls encounters in present day China is "proceed from reality, and let experience be the only standard of truth."

He cites an allegory attributed to Deng Xiao-ping ("It does not matter whether it is a white cat or a black cat, as

long as it can catch mice") as evidence of the vice-premier's intention to create a society that works and produces the best possible livelihood for China's billion, rather than to create a society that fits perfectly into a theoretician's mold.

Walls also notes that the Chinese are beginning to introduce a formal legal system in an attempt to institute some protection for individuals from their peers.

Until recently, the practice that has prevailed in China left it up to each community to decide what should be done when transgressions and crimes are committed.

The Chinese are 'walking a tightrope'

In some instances, this "neighborhood justice" works well but in other instances it works against the brightest and most original minds — members of communities might suggest ideas for which they could be punished without benefit of formal legal process, Walls explains.

Under the previous system, individuals could be put in solitary confinement in 'cow sheds' without due legal process, or be paraded through the streets wearing dunce caps.

They are not trying to do away entirely with neighborhood justice which works well in many instances, he says. A couple seeking a divorce, for example, still has to go through a neighborhood committee to see if members of their community consider their marriage salvageable.

"It depends upon the goal. They still want community solidarity."

Walls says the Chinese are "walking a tightrope" as they attempt to remain faithful to the principles of socialism and egalitarianism while at the same time they seek to foster modernization.

Noted Chinese painter demonstrates technique

Fan Zeng, considered one of China's best living artists, is visiting Uvic's Centre for Pacific and Oriental Studies. While here he is lecturing on and demonstrating traditional Chinese styles of painting. Zeng, who teaches at China's Academy of Arts and Crafts is shown demonstrating his own technique. This painting style is done with the same brush and brush strokes used in calligraphy, the formal method of Chinese character writing. Continual practice of calligraphy is essential, says Zeng, to achieve mastery over the brush.



Multi-disciplinary team studies metals, pollutants and rehabilitation with \$500,000 NSERC grant

By John Driscoll

Thousands of salmon, now kept in holding tanks on campus, may provide the key to unlock an environmental mystery.

What is the effect of prolonged exposure of juvenile salmon to sublethal levels of copper and zinc?

Thirteen scientists in three departments at UVic are working on this mystery and two others in a three-year, \$500,000 study of aquatic and marine pollution.

The scientists, now into the second year on the project, are funded by a Strategic Grant in Environmental Toxicology from the National Science and Engineering Council, one of the largest grants of its kind ever awarded in Canada.

"We know what levels of toxicity will kill the fish," says Dr. Alistair Matheson, chairman of the Department of Biochemistry and Microbiology.

"What we don't know are the safe levels of copper and zinc for juvenile salmon. We are attempting to find a rational method of setting limitations.

"Such information will be of great value to both the fishing and mining industries and to government officials faced with setting these levels."

Matheson, Dr. J.T. Buckley (Biochemistry and Microbiology), Dr. Alex McAuley (Chemistry), Dr. Paul West (Chemistry) and Dr. Derek Ellis (Biology) are coordinating the overall research activities under the NSERC grant.

In a series of carefully controlled experiments coordinated by Buckley, hundreds of juvenile salmon have already been exposed to sublethal levels of zinc and copper.

"We set up some long-term experiments and our preliminary data indicates that salmon become tolerant to high levels of metal in the water," says Matheson.

When first exposed to the metal, the fish refused to eat normally and this resulted in weight loss. Soon after, the fish began to recover their appetites and by nine weeks their rate of growth was back to normal, indicating they had somehow learned to tolerate the metal in their water.

The scientists are planning a series of further experiments this year and have collected 5,000 coho fingerlings, 2,000 rainbow fingerlings and several hundred yearling rainbows from the fish hatchery in North Vancouver.

What Buckley and his group are probing is the cellular mechanism by which the fish

adapt to higher concentrations of copper and zinc.

"We are looking for changes within the fish cell to get a handle on how the fish are adapting to the increased concentrations of metal," says Matheson. "This involves obtaining a 'protein profile' of the cell to see what changes are occurring at the molecular level."

Matheson points out that copper and zinc are required as trace elements by the fish for growth, but it is not known what the safe levels in water are.

"It is known that fish can detect very low levels of these metals in water and they attempt to avoid areas where these concentrations exist."

Matheson says there are lakes in British Columbia which contain high levels of copper and zinc in a natural state. Researchers will attempt to study fish from these lakes to observe how they have adapted in the natural environment.

Connected with the salmon project is a study of the effects of copper and zinc on the susceptibility of salmonids towards infectious diseases.

"Bacterial infections kill many young fish," explains Matheson. The scientists are studying the effects that higher concentrations of metal have on the way the bacteria affect the fish and the properties of the bacteria which allow them to multiply in salmonids and cause disease.

Dr. T.J. Trust and Buckley are internationally recognized for their studies on fish disease and nutrition. They are working on the salmon project along with Dr. E.E. Ishiguro, Dr. J.L. Nichols, and Dr. W.W. Kay of the Department of Biochemistry and Microbiology.

Chemists McAuley and Dr. G.R. Branton are also working on the project, studying forms of the metals in the water that are toxic to fish.

Joining the project is Dr. Alec McCarter, former director of the Cancer Institute at the University of Western Ontario, who is at UVic on study leave this year. Dr. Bob Olafson is a protein biochemist at the University of Western Ontario, who will join UVic's Department of Biochemistry and Microbiology and the toxicology project in January.

About two-thirds of the total NSERC grant will be used on this project.

The second project is a study of trace contaminants within the marine system

which may be more harmful to living organisms when they are present as compounds with other pollutants such as the sugars in pulp waste.

This project involves chemists West, Dr. R.H. Mitchell and Branton, biologist Dr. Michael Ashwood-Smith and biochemist Kay.

"This is a problem of particular concern to this area because of heavy petroleum transport, wide pesticide use and the presence of pulp mill effluents," says West.

Matheson explains that often trace contaminants cause no special problem, but under certain conditions they can become converted to a more toxic form.

Scientists in this project are attempting to identify, characterize and synthesize these contaminants and study their effects on fish and other marine organisms.

West and Mitchell have been involved in research on the biological effects of trace contaminants in some pesticides while Ashwood-Smith is internationally known for his work on mutagenic effects at the cell level.

"We want to study the toxic effect of these contaminants in the sea and investigate ways in which the pollutant level can be reduced," explains West.

"We also want to understand what pathways now exist in nature to control pollutants."

The third project deals with the rehabilitation of marine areas affected by industrial wastes such as mine tailings. Ellis, with the assistance of Matheson and McAuley, is in charge of this project.

The scientists were awarded \$153,000 in the first year of the NSERC grant, \$175,000 for the second year and are expecting a similar grant for the third year.

"We are now getting somewhere with this study and I believe we'll have some solid answers at the end," says Matheson.

Matheson believes the project has already had a beneficial side-effect. "It has allowed for meaningful discussions between three groups of scientists who would not normally have that interaction," he says.

"This kind of collaborative research can be very fruitful. At UVic we are exceptionally well-equipped for a multidisciplinary approach. This university now has the expertise for this kind of project."

RE-TECH with



At Re-Tech Sandy Rattray researches the retrieval of processing plant



Feeding the fish is part of the job of fish physiologist Carol Randel of the Department of Biochemistry and Microbiology

Well, well, well

To conduct highly controlled experiments involving several thousand salmon and measurements at the molecular level, you have to set things up very carefully.

You also have to have the correct plumbing.

The salmon used in experiments by a group of UVic scientists investigating the effect of prolonged exposure of juvenile salmon to sublethal levels of copper and zinc have been taken at the same time of year for two years from a fish hatchery in North Vancouver.

The water on campus in which these salmon have been placed both years is from three wells dug on campus.

Two of the wells are under the Department of Biochemistry and Microbiology which is housed in former army huts adjacent to the Old Gym. The third well was drilled across McKenzie Road to meet the increasing demand for water.

The fish are first kept in holding tanks outside the huts. For the experiments they are placed in rows of tanks within one of the huts.

-TECH: Making better use of our resources without 'beating nature to its knees'



researches the retrieval of protein from effluent from a fish

Driscoll photo

By John Driscoll

"You don't have to use a sledgehammer to crack a nut."

Dr. John Wood, research director of Re-Tech, a pioneer firm in UVic's Discovery Park, uses that phrase to sum up Re-Tech's philosophy.

Re-Tech has grown out of the consulting interests of Dr. Robert O'Brien (Chemistry) and now employs eight people working on several applied research projects to make better use of Canada's natural resources.

Re-Tech also makes use of professors in several departments on campus as consultants.

"Technology does not have to beat nature to its knees as it has done in so many instances," says Wood. "Re-Tech takes a more sophisticated approach to the use of our resources, attempting to work with nature rather than against it."

This approach has resulted in four major projects at Re-Tech and many other ideas for new ways of handling natural resources.

These projects include:

- a cheap and efficient method of collecting oxygen-enriched air which could, according to Wood, "revolutionize industrial thinking";
- development of an environmentally safe fungicide to protect commercial conifer seedlings, as a substitute for toxic fungicides which are a potential hazard to man and wildlife
- recovery of foodstuff for animals from the effluent from fish processing plants
- harnessing huge quantities of electrical energy generated from the mixing of fresh and sea-water.

"Our idea is to use the minimum number of tools to do the job," says Wood. "In every project we are working on, nature points the way. Knowing where to look for the answers is the key."

An oxygen-enhancement process developed by O'Brien is a good example of where to look.

Air is made up of about 80 per cent nitrogen and 20 per cent oxygen. The nitrogen plays at best, a neutral, and often a negative role in nearly all processes in which air is used chemically.

O'Brien has developed an inexpensive way of separating oxygen and nitrogen in air, a method which could have far-reaching applications.

Wood feels that O'Brien's oxygen-enhancement project is "getting to the point where a small pilot plant would be worth trying out."

The project has been in the laboratory stage for several years and O'Brien has developed a small working model utilizing his method of collecting oxygen-enriched air to increase the amount of oxygen in air by 50 per cent.

O'Brien's method is to dissolve air under pressure in a fluid with a water base. The fluid is then allowed to expand suddenly through a nozzle and pass over a special surface. On this surface oxygen bubbles form which can easily be collected to create oxygen-enriched air.

Wood believes O'Brien's method could be used by industry to replace the huge oxygen liquefaction processing plants which he describes as "clumsy, costly and dangerous".

"Liquefying oxygen is a horrible and unnecessary method to use to get oxygen-enriched air for industrial use," says Wood.

There are few processes involving air or oxygen where pure oxygen is used."

Wood feels that industry is not eager to see oxygen-enhancement programs because the process would make liquid oxygen plants obsolete and bring in a new generation of smaller, cleaner furnaces. "Enhanced oxygen could be used in all combustion processes including coal, oil, hog fuel and municipal wastes.

"With enhanced oxygen, things burn better with a smaller boiler and higher temperatures are achieved. There is less gas flow, less energy wasted and less pollution."

There is also less danger than with liquefied gas. The practical benefits are many, according to Wood.

With some small modifications, a super-charger could be placed on a car which would run on oxygen-enhanced air to get better mileage.

Cheap oxygen-enriched air could be used to cut down pollution in pulp mills and increase the capacity of lime kilns. Chlorine and chlorine dioxide could be replaced in the Kraft pulp bleach process.

There are other applications, in oxygen tents, smelting processes, cement kilns and in the treatment of sewage.

"The present use of liquid oxygen is expensive and liquid oxygen is extremely dangerous and difficult to transport," says Wood. "Oxygen-enhancement can be an on-site process and can be tailored to a particular site."

In a greenhouse on campus, Re-Tech is attempting to develop an environmentally safe fungicide for moulds such as botrytis (grey mould) or fomes (root rot fungus) which attack forestry species.

Botrytis attacks seedlings grown in plant nurseries and stored over the winter, resulting in the loss of many of these seedlings before spring planting.

There is a growing concern about toxic fungicides currently used to protect forestry species because of their concentration in the food chain and their harmful effects.

In contrast, fatty acid compounds are naturally occurring compounds secreted by animals including man to protect the skin. They are non-toxic and are effective as a fungicide.

The research at Re-Tech involves the



From left, Re-Tech's Helen Becker and David Robertson, with Wood, check the progress of hemlock seedlings

synthesizing of a wide range of chemical derivatives of one fatty acid (capric acid) and testing these for fungicidal activity in hemlock seedlings.

The compounds are labelled with a safe radiochemical tracer to see if the fungicide has been incorporated into the plant and distributed throughout the system.

"We'll select about four of the best fungicides from among 20 we have synthesized," explains Wood.

This research is sponsored by the Canadian Forestry Service.

In another project Re-Tech researchers have developed a process by which valua-

foodstuff.

"This process could be applied at any fish processing plant and would at least pay for itself while resulting in cleaner effluent from the plant."

The research on this project is sponsored by the B.C. Science Council and Re-Tech is now attempting to get a pilot plant to try it out on a larger scale than at Steveston.

Perhaps the most intriguing research carried out at Re-Tech is a study of "salinity power", the electrical power that can be harnessed when sea water and fresh water are mixed in a reverse electrodialysis cell.

"The size of the resource is immense," says O'Brien. "B.C. rivers produce about 50,000 megawatts of salinity power and this energy is a continuous renewable resource, causing no pollution."

In his laboratory O'Brien has conducted several experiments with a small model, mixing Victoria city water with Oak Bay seashore water.

In these experiments the cell maintains its voltage and power through a month long period. "Power output is admittedly very small at present," says O'Brien. "Quite a lot of applied technology will be involved in increasing the power output to practical levels. But even great oaks have to start as little acorns."

Re-Tech is now designing a larger model for use in practical circumstances. "We may be able to start the larger model in January at the estuary of a local river, possibly in Bamfield," says Wood.

Re-Tech has travelled some distance from its inception in 1969.

Wood joined Re-Tech in 1978 when the firm was renting space in the Chemistry Department at UVic. In 1978 Re-Tech moved into 240 square feet in a trailer at the McKenzie Road entrance to campus, an original tenant of UVic's fledgling Discovery Park.

Now the firm is renting part of a hut on campus as well as the trailer and greenhouse space.

If and when UVic has a permanent building for Discovery Park tenants, O'Brien and Wood plan to be pioneers in the new building.



Woods: "a sophisticated approach"

ble amounts of nutrients and protein can be recovered from the effluent from fish processing plants.

"We've been trying out the process on a small project at a fish processing plant in Steveston and the results have been dramatic," says Wood. "Almost all the protein in the waste has been recovered."

This protein can be used as a food supplement for poultry and livestock and as the main article of food for trout hatcheries.

Re-Tech's recovery process does not use any reagents which are unacceptable in



Suzanne Cannon, a technician in the UVic physics department stands beside an electron spin resonance generator she uses to analyse coal. A sample is placed between the poles of an electromagnet and bombarded with microwaves; the resulting measurements give structural information about the hydrogen and mineral content of the coal.

B.C. coal deposits undergo close study

By Tim Humphreys

Coal in abundance, enough to meet all of B.C. energy needs for many generations to come, lies beneath the southeast and northeast corners of British Columbia. To date, it is only a potential energy source requiring tremendous research efforts in geological sciences and processing technology before it can be used effectively.

This need has led the Science Council of B.C. to begin a four year, \$5 million research program, a small but important part of which is being carried out by Dr. Paul West (Chemistry) with a \$23,900 Science Council grant.

The research is designed to explore two basic problems, the first associated with weathering, which causes coal to oxidize and lose some of its value as a fuel and steel-making component. The second problem is associated with the conversion of coal to a more useful form by a process called liquefaction.

The research will lead to a ranking of B.C.'s coal in terms of its convertibility to synthetic oil.

"B.C.'s coal originated in a different geological epoch than eastern North American coals, so much of what is known about those cannot be applied to B.C. deposits. The seams are badly faulted in the Rockies and that means they are subject to weathering in a different way in different places. Every time we open up a new seam, the problems must be analyzed again", explains West.

"We would like to understand how the oxidation process occurs, but because of the chemical complexity of coal, it is difficult to establish any single method of measuring oxidation.

The differences in composition and the extent to which it has suffered oxidation through weathering must be known because they are factors directly affecting the use of the coal in two important areas: coking, for steel making, and liquifaction, for making synthetic oil.

Coke is a carbon residue left when coal is heated to high temperatures in the absence of air. Mixed with iron ore in a blast furnace it burns at very high temperatures, at the same time emitting carbon monoxide, which reduces the iron oxide in iron ore to pure iron.

Because weathering adds oxygen to the coal it can severely affect its value for steel making purposes, thus decreasing its selling price.

Weathering also affects the process of liquefaction. The main difference between coal and oil is hydrogen. Oil has a lot, coal very little. To change coal to oil, add hydrogen. It requires high temperatures and pressures to do this, but the technology

exists, though at present it is relatively expensive when compared to the cost of naturally occurring oil.

"Weathering reduces the reactivity of coal for liquefaction," explains West. "Our work at UVic is designed to explore the amount of coal liquid the various types of coal in the province will give." This is done by heating coal samples to 400° centigrade in a hydrogen atmosphere. About 80 per cent of the coal is liquified.

The selection of coal samples for this testing is closely coordinated with other labs doing research at B.C. Research and the Ministry of Energy, Mines and Petroleum Resources.

West is also involved in other research aimed at making sure the process is environmentally safe. With five other UVic scientists, he is studying toxics in the environment under a \$500,000 Natural Sciences and Engineering Research Council (NSERC) grant (see story page 6).

West points out that coal is a potential polluter. "Undoubtedly, raw coal liquids are going to contain potentially significant environmental contaminants, but with proper secondary processing, any hazard to the environment can be largely averted."

While encouraged by the sound start that has been made to coal research in B.C., West points out that it is still only at the formative stage on a world standard. The United States, Japan and western European countries are spending far more.

In the long term B.C. is looking at a stupefyingly complex program that will need people with skills, especially those associated with the engineering sciences. All the assessments for skilled manpower in B.C. are based on the status quo. They become irrelevant when measured against the requirements of a mature coal industry in the future, West points out.

United Way campaigns

UVic's United Way campaign has received a total of \$13,550.80 from 139 donors for an average gift of \$97.49, says Bob Savage (Personnel), the campaign coordinator.

He suggests that an hour's pay per month, equal to half of one per cent of annual salary, is a reasonable guideline for making donations. If you have any concerns about the campaign, call Savage at local 4225.

Instant gonorrhea diagnosis?

Immunologist Dr. Terry Pearson (Biochemistry and Microbiology) who has received a \$100,000 grant from the World Health Organization to devise a diagnostic test for African sleeping sickness now plans to devise diagnostic tests for other diseases, including gonorrhea.

African sleeping sickness (trypanosomiasis) is a debilitating parasitic disease introduced by the bite of the notorious tsetse fly. It ravages millions of people and cattle throughout Africa.

The current diagnostic test for sleeping sickness involves taking a blood sample and looking for trypanosomes or antibodies against trypanosomes which would be present in a person suffering from the disease.

The problem lies in the fact that the symptoms of several diseases in tropical countries resemble those of sleeping sickness, especially in the early stages of the disease.

"The current test is not so good because it is not 100 per cent accurate," explains Pearson.

"Extremely toxic drugs are used to fight sleeping sickness, drugs that should not be administered unless absolutely necessary."

In his laboratory Pearson and research assistants are attempting to dissociate the many components of a sample of trypanosomes to determine the total number of antigens which are molecular parts of the parasite.

Pearson then plans to make specific monoclonal antibodies to the common antigenic components present in various

strains of the parasite. These monoclonal antibodies can then be used as highly specific probes for the sleeping sickness antigens present in the blood of infected individuals.

"If the results with sleeping sickness patients are positive, these monoclonal antibodies can be used for diagnostic testing," explains Pearson.

The monoclonal antibody technique was developed in England and Pearson worked at Cambridge with the scientists who developed it.

"Because I knew the technique I was recruited to Nairobi, Kenya by the World Bank to apply the new technology to the study of two parasitic diseases of cattle."

In Nairobi for two years, Pearson became more interested in tropical parasites, working with malaria and sleeping sickness.

He plans to use a monoclonal antibody technique to devise a new diagnostic test for gonorrhea, a venereal disease which is widespread throughout the world.

"With the present diagnostic test for gonorrhea, there is a waiting period of 48 hours for the results from a test sample. This can cause some problems and it is an expensive process as well.

"Using a monoclonal antibody technique we should be able to devise a quick biochemical test for gonorrhea with an immediate diagnosis."

Pearson believes monoclonal techniques can be used to devise new diagnostic tests for many diseases. "I plan to branch out into several human diseases," he says.

Salmon eggs and suntan lotions used in research

Freezing salmon eggs and reviving them may not seem to have much in common with the prevention of skin cancer. To UVic biologist Dr. Michael Ashwood-Smith they are both part of his basic research into the way cells are damaged by adverse environments. Whether the adversity is caused by freezing, high radiation or chemicals, the result is often the same: the cell is killed or its ability to reproduce properly is damaged.

Ashwood-Smith's findings may lead to further applied research into the prevention of skin cancer and better ways to restock salmon fisheries.

The process of freeze drying cells is used routinely to preserve penicillin and blood plasma for hospital use, and to preserve bacteria and viruses for vaccine preparations.

There are two basic problems with the process. One is the large number of cells killed in the freezing process, the other a recently discovered problem of cell mutation occurring in a tiny proportion of the cells that survive. If 10 per cent of cells survive freeze-drying, one in 10,000 will have genetic damage, says Ashwood-Smith.

Because very few cells survive freeze drying, Ashwood-Smith is also trying to find out what kills them during the process and why the proportion increases over time. Once this research is completed, the results can be applied in research on specific problems.

This is the stage where the salmon eggs enter the picture.

An egg is a big cell, one of the biggest produced by a living organism. In salmon nature has evolved some surprising characteristics to protect the eggs from rough treatment. While those characteristics make the eggs' chances of survival high in a natural state, they also make it hard for man to preserve them for use at a later time.

When salmon eggs are deposited in the gravel on the bottom of a stream bed they immediately begin a process called "hardening". The outer membrane of the egg takes in water and becomes very tough.

The fact that the membrane takes in water suggests that water can also be removed. The problem is keeping the eggs alive as the temperature drops and water leaves the cell.

"We intend to treat this as a basic problem in cell physiology," says Ashwood-Smith.

Smith. "To begin with, we will work on a model fish which has an egg laying cycle that can be adapted to the lab. Once we have a better understanding of the mechanisms of fish egg physiology at low temperatures, we can proceed with the salmon egg and embryo studies."

In this case, the basic research may lead to applied research in better fish breeding and stocking procedures to be used when a natural or man-made disaster affects spawning grounds or wipes out breeding fish.

But this area of basic research, important though it may eventually be to maintaining food supplies and assisting the fishery industry, may also have important results in preventing skin cancer in humans.

While freezing damages cells and causes mutations, so can the ultra-violet radiation in sunlight. In some cases this damage may be increased by the presence of certain chemicals in the environment.

Ashwood-Smith has already discovered one example of this in a number of brands of European suntan oil.

In 1969 a suntan preparation was introduced in Europe with a unique property which helped induce tanning. The secret of the process was a chemical of the psoralen family called 5-methoxypsoralen (5-MOP).

While the evidence is very strong that 5-MOP in the suntan preparations can cause skin cancer in humans, Ashwood-Smith is seeking more direct evidence.

One way to achieve this is by examining white blood cells (lymphocytes) and measuring the variations in some of the biochemical components of the cell.

"Changes in lymphocytes are indicators of genetic change. We are collaborating with the Medical Research Council at the University of Sussex in Great Britain by providing a control group of samples not exposed to psoralens in suntan preparations. The samples will then be compared with those taken in Britain, which should include some of people using preparations with 5-MOP."

Ashwood-Smith has received a \$24,900 renewable grant from the National Research Council for his work on freeze-drying cells, and a grant of \$55,000, with co-researcher Dr. Brian Harvey, from the Science Council of B.C. for the salmon research. He hopes to get similar funding for his research with psoralens.

'The acid test is sales'

Hypothermia cure hits the market

By Donna Danylchuk

The UVic Heat Treat, the new emergency rescue treatment developed for people suffering from the potentially fatal chilling of the body's inner organs, known as hypothermia, is being delivered to its first customers.

Two British Columbia companies are manufacturing components for the device which provides a rapid method of rewarming the heart of hypothermia victims with warm water-saturated air delivered directly to the central circulation via the airway and lungs.

The Heat Treat was designed and developed last year by Dr. John Hayward (Biology) and electronics technician Robert Douwens of the same department.

Over the past year the two men have been refining the model and seeking the necessary approval from medical and electrical licensing agencies. Now they are testing the market.

Hayward and Douwens have filed a patent application for the Heat Treat in the United States ("It's the best place to go — it's fastest") and are personally funding the initial manufacturing and distribution under the aegis of their own company, Sci-tech Products.

The major components of the Heat Treat are being manufactured by Scott Plastics of Victoria and Dickinson Marine of Vancouver.

"The acid test is sales," says Hayward, citing among the Heat Treat's initial buyers the Canadian Coast Guard in Vancouver, North and West Vancouver Search and Rescue, the Australian Ski Patrol, Emergency Medical Services in Washington State, Colorado Search and Rescue, Parks Canada Alpine Rescue, the Tofino Hospital, Campbell River Search and Rescue, and Marine Rescue Auxiliary.

"More orders are coming in and a lot of inquiries. We're hoping that it will be well received by users. Second orders will tell — we have already received one from the Canadian Coast Guard.

"We have made 30 models, which was all we could personally afford. I feel that if you really make a commitment to an invention, you should be prepared to risk your own money. If somebody else takes a risk, it will cost more to users in the long run. By keeping risks to ourselves, it keeps costs down."

The reputation of the Heat Treat is spreading rapidly throughout North America, and a representative from Parks Canada Alpine Rescue plans to take a model to Europe shortly to exhibit to the European Association of Alpine Rescue Specialists.

Customers order either electric or propane-fired devices, depending not only upon their pocketbooks but uses to which it will be put. The distinctive feature of the device is its portability and effectiveness in remote regions such as ski hills where electricity is unavailable and only the propane-fired model is of use. The electric model is designed for rescue vehicles such as helicopters, boats and ambulances.

The Heat Treat can be purchased as a total system or in parts — the valve is the essential component, explains Hayward. Costs range from \$25 to \$800. "For \$100 you can get a system that will work. It depends upon the amount the customer has to spend, and whether they use their own steam producer. It can also work with an ordinary electric kettle or stove and water pot used by hikers.

The impetus behind the development of the Heat Treat was the need for a device to combat the 'afterdrop' factor in hypother-



mia victims, which is the cooling of the body's core temperature that continues for a period even after the external cold stress is removed and the person is insulated. The cooling of the heart is critical. A heart temperature of just below 30 degrees Celsius can kill.

This afterdrop in core temperature may increase if the body is rewarmed from the outside in rather than from the inside out. Once the extremities and skin temperature is restored to normal, the message 'I am cold' doesn't go to the brain. Nevertheless, the core temperature continues to drop as increased circulation drives cold, stagnant blood from the peripheral tissues to the inner body.

Hayward was not a stranger to hypothermic research when he began to think about ways to combat the afterdrop factor. Research he had conducted with Dr. Martin Collis and Dr. John Eckerson of the UVic School of Physical Education, beginning in the early Seventies, was instrumental in making hypothermia a household word over the past few years among outdoor enthusiasts, and contributed substantially to the development of a science of cold water survival.

The team designed and patented the UVic Thermofloat jacket, now the best selling specially-insulated flotation jacket in the world, and also the SeaSeat, an inflatable pint-sized raft which can be carried in the pocket of the Thermofloat or other Personal Flotation Device (PFD).

They collaborated with the United States Coast Guard on a study of rewarming methods six years ago, and found that inhalation of moist, warm air through the respiratory tract and lungs was an effective, safe and simple method to donate heat into the chest where hypothermic victims need it most. A few years later, at a search and rescue meeting in Colorado State, after listening to extensive accounts of problems faced by rescue parties in remote regions, Hayward decided that a non-electric portable head inhalation model had to be developed.

Hayward approached Douwens two years ago with a theory and description of what was needed, and Douwens by last summer had developed a prototype model for a sophisticated stainless steel kettle, which can operate with either propane or electricity. He also designed a face mask and air tube and a valve system which controls the mixture of steam and air

breathed to ensure an inhaled temperature of 42 to 43 degrees Celsius.

The Heat Treat thus is based on a simple principle while meeting the challenge of how to provide safe, effective first-aid treatment at remote locations. It allows the rescuers to use a hospital-type treatment at the rescue site, hopefully to reduce the number who are dead on arrival at hospital.

The stainless steel device weighs only three kilograms and starts producing steam within 10 seconds, saving time which could be crucial to the life of a seriously hypothermic victim.

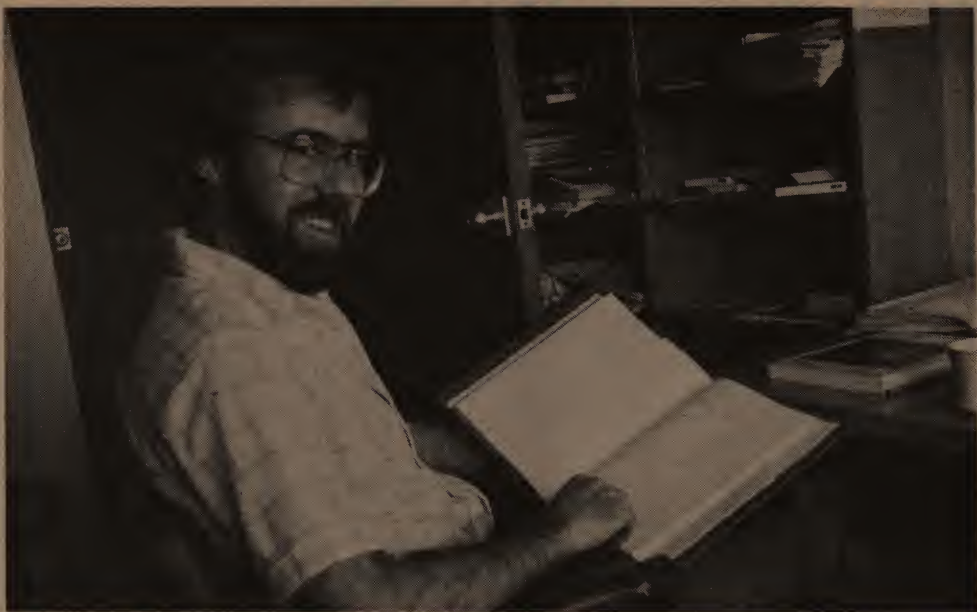
If and when the Heat is proven on the marketplace, is patented, and has acquired all the necessary approvals of medical and electrical licensing agencies in Canada and the United States, Hayward says he and Douwens will be in a stronger position to hand its entire manufacture and distribution over to the business world.

"To go from a glint in the eye of enthusiastic researchers to delivery of a variety of models to consumers is a big step. The next step will hopefully be to hand over to a firm which goes into larger mass production."

The UVic Thermofloat jacket has been a successful innovation, by all criteria and has reflected well on the university. We hope, and have early indicators, that the same will be the case for the UVic Heat Treat.



RCMP funds voice identification research



Dickson: heavily involved in voice identification research

The RCMP has awarded a \$97,000 contract over two years to Dr. Henry Warkentyne, chairman of the UVic Linguistics Department, for development of an automatic computer-controlled speaker recognition system.

The contract has been awarded by the Special I branch of the RCMP, to enable Warkentyne and graduate student Craig Dickson to carry on research started in Dickson's 285-page Masters thesis, which he recently completed under Warkentyne's supervision.

The contract includes payment of salaries and computer costs over the two-year period.

The men are in regular contact with the funding body in Ottawa, which also is involved with research into fingerprinting and handwriting identification.

There has been some controversy surrounding the use of the human voice in forensic investigations since 1935, when the court case following the kidnapping of Charles Lindbergh's son led to a conviction and death sentence for the defendant, with voice identification being accepted as one of the main pieces of evidence.

Law enforcement agencies no longer rely on human memory and subjective human judgement to make voice identifications, and seldom use voice identifications as primary evidence material. The most common method of voice identification in use now is obtained with an instrument called an acoustic spectrograph, which measures aspects of a person's voice such as timing, frequency and intensity and plots these on a graph called a spectrogram for study and comparison.

But, spectrograms or 'voiceprints' may be affected by a person's attempt to disguise his or her speech or by stress or illness. Subjective elements can enter into the comparisons of voiceprints and telephone line distortions might affect spectrographic readings.

The researchers want to bring scientific validity into the voice identification process by isolating and finding the parameters for those speech sounds of an individual which can't be shared with

other voices, nor be consciously or unconsciously altered. As Dickson says, "For speaker identification to work, we must be able to identify a voice as being a speaker's own and nobody else's."

A key feature of the work is the software component, a computer program called SPECTR which has been developed by Dr. Samuel Wong (Academic Systems). Using SPECTR, the men are able to isolate the speech elements they are studying, using voice tapes submitted by volunteers, and to subject these speech sounds to intensive statistical analysis and comparisons.

The sounds they are looking at are the nasal murmurs 'm', 'n', and 'ng'. For his thesis Dickson studied the intra-speaker parameters of nasal speech sounds among 12 males having western Canadian dialects. He is now recruiting more volunteers to continue capturing voices on tape, analyzing the audio signal with a real-time spectrum analyzer coupled with storage scope which displays the speech patterns in graphic (analog) form, and feeding the results into the computer for analog to digital conversion.

On a computer terminal, he studies and applies the digital speech patterns to a wide variety of analyses, in order to establish the parameters for the speech sounds of each individual. He and Wong are currently redesigning and transferring the software programs they developed on a mini-computer down to the main frame in the basement of UVic's Clearihue Building, in an attempt to speed up the time required for analysis.

Basically, explains Dickson, the research is based on using acoustic signals as indicators of what shape the vocal tract is — in this sense, the work has a physiological basis in the same sense as fingerprinting. It is thought to be highly improbable that two speech tracts would be capable of continually producing identical vibrations and resonances.

Speakers may vary certain speech sounds, especially vowels, by altering the pitch, tonal patterns or speed of speaking, or by changing the movements of the jaw, tongue or lips. But they do not have the

same power to change the sound of nasal consonants since the nasal cavity is not subject to the same degree of change as the vocal cavity, and reflects a more consistent pattern of resonance. Sounds which cannot be consciously altered by speakers are therefore thought to accurately reflect physiological differences.

Dickson stresses that nasal murmurs are only one of the aspects of speech which can be studied to develop techniques for accurate voice identification.

"Certain perturbations or irregularities in the vibratory action of the larynx may have as much validity for identifying the speech signal. Nasal murmurs can't be the only distinguishing aspect. Their study will contribute something, but not everything. The greater the number of aspects of speech we can explore and isolate and for which we can discover speaker-identifying parameters, the greater the possibility of accurate speaker identification."

Although research into speech recognition has been going on for several years at various locations in North America, Dickson's study is unique and non-collaborative in that he is studying the parameters of speech sounds of individual speakers. Inter-speaker comparisons come later, once ranges of intra-speaker variability are established.

Researchers into speech and speaker recognition make a distinction, discussed by Dickson in his thesis, between speaker identification and verification. Verification means verification by a co-operative speaker that he or she is who he claims to be, by speaking a key word or phrase in person or over the telephone for comparison with a reference voice sample. It has possible uses in banking, credit authorization, access to computer files, or in security systems.

Dickson points out that a number of

automatic machine analysis systems for speaker verification are now being investigated, and although both speaker verification and identification tasks are hampered by unacceptable error rates, speaker verification has proven to be successful and useful under controlled conditions. There is little doubt that more powerful speaker discriminating parameters and improved signal processing techniques will increase the success rates.

"It is expected that sophistication in speaker verification techniques will reach a state where a verification system cannot be fooled by mimicry or other speaker-related interferences, and it can be used under telephone line-distorted conditions."

Dickson says the problem facing researchers into voice identification is to develop a speaker identification system that will work as well as verification systems.

A realistic situation for recordings of unknown voices for forensic identification would be over the telephone, during extortion attempts or bomb threats, when speakers may be attempting to alter or disguise their voices. Files of known speakers' voices would be kept, much the same as are fingerprints, and catalogued on the basis of dominant feature speech values. There could be no room for error, or innocent persons could be unjustly accused.

For a speaker identification system to have this degree of success, says Dickson, a large number of parameters must be discovered that cannot be varied by the individual, the parameters having values that in combination are unique for the individual.

"If these cannot be found, the demands for absolute accuracy in speaker identification will not be met. The speaker identification tasks will therefore be limited to an estimation of probability that two utterances originated from one speaker."

Fitness expert joins Faculty

Fitness testing is taking on a new emphasis, according to Dr. Howard Wenger, new co-director of the UVic Sport and Fitness Testing Centre.

In the strict sense, fitness testing is ancient — people always had some idea who among them was the strongest, fastest and most fit generally, but today there is a change.

"The whole concept of testing no longer says 'here is a picture of you'. Now we like to do an evaluation with intent. We want to know the strengths and weaknesses so that a proper fitness program can be developed. Fitness tests should be used for building," Wenger believes.

Staff in the Sport and Fitness Testing Centre test many UVic teams and work with the coaches to design a fitness program for each athlete. Athletes from the community come to the centre for fitness information and students use it to learn about fitness testing and the factors that influence fitness. Wenger also conducts fitness research here.

Wenger's positive attitude towards fitness testing is reflected in his views about learning in general. "I think the whole concept of learning is exciting and should be thought of by those who are learning as exciting. Students should see themselves as involved in a fascinating activity. We have to believe that learning is exciting, picture it in our minds as exciting, and it will be that for us."

Wenger did his PhD. in exercise physiology at the University of Alberta, taught at the University of Ottawa from 1971 until 1974 and then returned to teach at U of A until his arrival at UVic this September.

"I was happy in Edmonton, but you reach a point in your career where you feel you don't need a particular institution to support your work. There are progressive avenues developing in the School of Physical Education here and I want to be part of it. Besides I got sick of waiting for summer every year."

Students likely will find Wenger to be very friendly and interested in them as individuals. "I see no reason for confrontation or even a formal attitude between teacher and student. I like it when people are pleasant to me and so I try and be pleasant myself. Just because I see students as my friends doesn't mean I can't

constructively criticize their work. I let them know if their work doesn't meet my standards even though it may be satisfactory to them."

Wenger has a good word to put in for the fitness levels of professional hockey players. He is also a fitness testing consultant with the Edmonton Oilers, and says they are not the weak invalids many sports writers accused them of being after last year's tour of North America by the Russian hockey team.

"I was generally very impressed with their level of fitness. Players have to work on specific weaknesses, but they are all top athletes."

"Fitness testing can be very useful for a team. In 1972 I was a member of the testing team for the Philadelphia Flyers. The Flyers won the cup that year, and I'd like to think the fitness team did it."

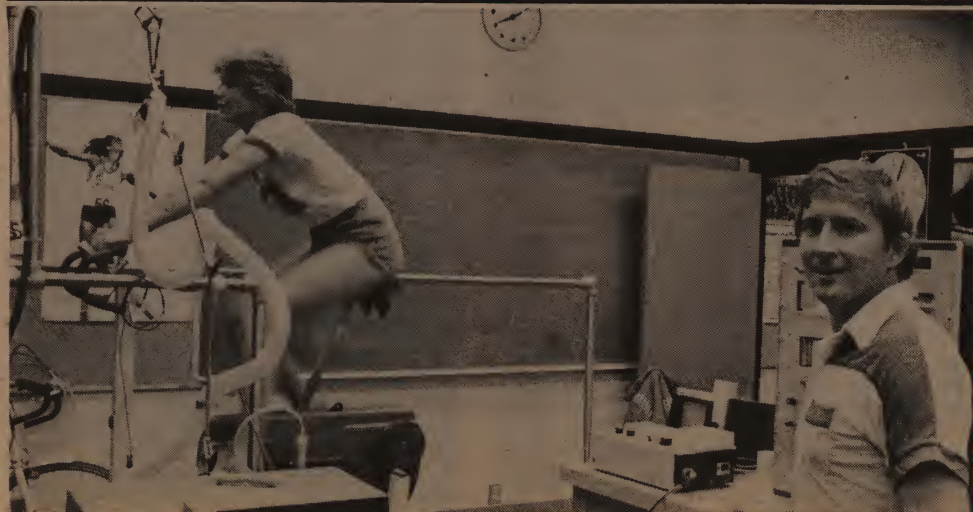
Wenger is also president of the Canadian Association of Sport Sciences, a group which includes most of the scientists, doctors and psychologists, involved in studying the scientific basis of sport. In addition to its value as a forum, this organization formulates position papers on sport and fitness topics as they relate to the Canadian scene, he explains.

"We have just finished a paper on the artificial preparation of athletes and are generally opposed to it. Anabolic steroids, for instance, result in transient and permanent changes that may seriously jeopardize the athlete."

"Presently we are studying the question of children and sport and when that is finished, will be working on the problem of exercise in the cold. These papers have no direct authority, other than our reputations, but they are considered by the Canadian Sport Medicine Council, and the news media usually report our findings."

Wenger's position on the Association of Sport Sciences involves a fair amount of paper work. "I often take flak because the paper shuffling is not always on time but I feel there are bigger issues. Detail men you can get anywhere, but people with ideas are scarce."

All this responsibility might daunt others but not Wenger. "Isn't it wonderful someone pays me to do the things I would do in my spare time?"



Wenger tests athlete Nadine Padur, pedalling above.

Durkin photo

Faces

by Tim Humphreys



Humphreys photo

If Don Stenton and UVic hadn't found each other, both would have been the poorer, and so probably would many UVic physics students.

Stenton is UVic's senior lab instructor in the physics and astronomy department, where, he says, "my main job is keeping the labs operational". But he is also an inventor with a number of useful devices to his credit that have saved the UVic physics department a few dollars, a lot of time, and have made the teaching and learning of physics in the lab a little easier. That's because when Stenton invents and innovates, his main aim is to make a better piece of teaching equipment, a vocation he readily admits wouldn't be possible without the support of UVic physics professors and technicians.

One of Stenton's major interests right now is computer-assisted learning, and he is an active member of UVic's team of researchers working to adapt the Telidon graphics computer to an educational role; the development of teaching labs has always been one of Stenton's main concerns.



"It's one thing to buy machinery, and another to use it. It's important to keep introducing innovative ideas into any educational program."

It's a philosophy that Stenton has adhered to since he started with UVic in the summer of 1962, assisting physics professor Harry Dosso on a research project. Shortly thereafter he became a lab instructor, and was a physics lab supervisor by the time UVic moved to its present site, where he began to use his talents for equipment design to their fullest.

One of Stenton's first inventions for the department was his "tangentometer", a circular measuring device with a semi-silvered two-way mirror. It allows an observer to see a line on a graph and the line's reflection in the mirror at the same time. The simple looking piece of equipment allows a quick and easy measurement of the slope of a curve in physics experiments.

"I almost got around to patenting that one, but things just got too busy in the labs," says Stenton.

Back then, his job as an instructor consumed only part of his time. "I had to keep records of the department's capital equipment and supplies, demonstration equipment had to be maintained and supplied on request and photographic production and slide presentations increased at a very rapid rate as the physics department grew," says Stenton.

Growing equally fast was the demand for new courses and new lab experiments to teach students the basics of physics. As the demand for equipment grew, Stenton began to adapt and invent equipment to meet the need.

"The inventing process begins when you have a problem. For example, we were using oscilloscopes to demonstrate the doppler effect, where the frequency of sound waves increases when a sound source approaches the listener and then decreases as it recedes. The oscilloscope shows the effect visually on a screen, but we wanted a static, or non-moving, record. The only oscilloscope cameras back then were huge unwieldy things and very expensive, but Polaroid had just come out with a flat pack dental camera with a one-to-one object to picture ratio. It was completely portable, and it was just a matter of making a couple of adaptors for the oscilloscope, and we were in business with a portable oscilloscope camera at a fraction of the usual cost."

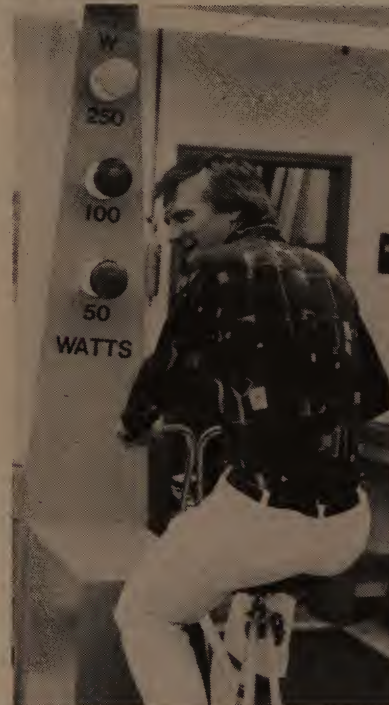
Polaroid came out with a remarkably similar device a couple of years later, probably "just a coincidence" remarks Stenton thoughtfully.

Another of Stenton's contributions to physics teaching is a design for a linear air track, used in physics experiments to measure momentum and collision phenomenon. One of the track's major functions is to eliminate much of the friction between a moving object and the track's surface by providing a cushion of air.

"We were encountering problems using commercially built tracks. A lot were not rugged enough to stand up to student use and others had design problems. I had some flat aluminum beams and some aluminum tubing in the lab, and just sat down and designed a different type of track. It was flat and nobody had ever built a flat track for this purpose before, so it was the first flat linear air track ever built.

The design was so good that it resulted in an invitation to Stenton to attend an American Association of Physics Teachers conference in New York, and the publication of a paper on the design in the September, 1979 issue of the *American Journal of Physics*. Stenton has since received worldwide requests for the air track plans.

With the development of the computer and computer-assisted learning, Stenton has found new problems to solve and new ways to pursue his aim of providing top quality teaching aids to UVic physics students.



"Computers are playing an important role in physics experiments and we are only just beginning to tap this 'learn-by-doing' approach using the computer in teaching. It's important that we adapt the technology and bring it into the demonstration and teaching labs. With the computers graphics capability and the added dimension of color it's possible to provide a greater in-depth analysis for some experiments," he explains.

The new technology is also playing an important role in computer-managed physics experiments for teaching purposes and in hands-on science shows, similar to the recent UVic Telematics Fair.

Stenton has, for several years, been actively involved in science shows, ranging from UVic's own Open House to school visits and more recently, science shows at Victoria's Mayfair Mall.

"I think the computer is going to prove to be a fundamental tool for providing a better understanding of science to all age groups," says

Stenton, and he is busy looking at ways to put computer-managed experiments into high schools and eventually grade schools in B.C.

Computer-managed experiments can be used to teach at all ages, with the computer providing prompting and interactive feedback to the student. Stenton is already developing courseware for the UVic computer to be used in the physics labs.

In the meantime, he isn't neglecting his other varied duties, which include supervision of about 30 lab instructors in physics and astronomy.

It's a point of pride for Stenton that many visiting physicists are impressed with the facilities and the equipment in the labs, which is understandable, since at least a little bit of that up-to-date equipment is Stenton's own design. "I can't take all the credit," he adds, when discussing some of the designs for science fairs and lab experiments. "They're all my designs, but I rely completely on the technicians here to get the equipment built, and built well."

Second research colloquium planned

Anyone involved in research related to agriculture or forestry is invited to participate in a day-long colloquium Dec. 16 beginning at 9 a.m. in the Board and Senate Chamber of University Centre.

This is the second colloquium organized by Dr. R.N. O'Brien (Chemistry) on campus this year, in an attempt to spark interaction between researchers in the same field.

The first colloquium dealing with medically related research was held in April and O'Brien described it as "very successful". About 50 people attended and 16 faculty members from five departments gave 10-minute presentations on their research.

Presentations of from five to 15 minutes are being sought for the December colloquium which is sponsored by UVic's office of research administration.

O'Brien says researchers in forestry and agriculture from government and industry have also been invited and some have agreed to speak at the colloquium.

"The interest of research administration is to bring all researchers in these two fields, which overlap substantially, together in both the academic field and the applied field," says O'Brien. "Some interaction to indicate where research is needed and possibly where funds might be applied is anticipated."

O'Brien said between 10 and 20 presentations are expected. Coffee and doughnuts will be provided as well as sandwiches at lunch. "Some discussion is expected at the end of each talk but it is hoped that after the formal presentations small groups will continue an information exchange."

Anyone wishing to participate in the colloquium can notify O'Brien or the office of research administration.

Lansdowne Lectures

Dr. Russell Barkley, director of the neuropsychology section of the Medical College of Wisconsin, will speak on "The Hyperactive Child" on Oct. 30 at 4 p.m. in Clearihue A101 and on "Drug Management of the Hyperactive Child" on Oct. 31 at 3:30 p.m. in Cornett 343.

Ronald Eyre, associate director of the Royal Shakespearean Company of Great Britain will give a free public lecture on "The State of Theatre in England Today" on Oct. 28 at 8 p.m. in Elliott 168.

Neuropsychologist publishes 'keystone' text



Gaddes: pioneer neuropsychologist makes new contribution

UVic Professor Emeritus and neuropsychologist Dr. William Gaddes has made a distinctive contribution to his field of research with the publication of his new book **"Learning Disabilities and Brain Function — A Neuropsychological Approach."**

The 402-page book, published by Springer Verlag of New York, Heidelberg and

Berlin, represents the result of 16 years work in UVic's neuropsychological lab, the first lab of its kind in the country to work with children with learning disabilities. Gaddes opened the lab in 1963 in collaboration with Dr. Robert M. Peet, a local neurologist.

Gaddes was UVic's first and only psychology professor for many years. He

joined Victoria College in 1946 and through his professional collaborations extended his interests until he became one of the pioneers in the emerging field of neuropsychology — the study of brain-behaviour relationships — in the late 1950s and early 1960s. Today UVic has the largest academic neuropsychology nucleus of experts in North America and draws graduates from around the world.

The book which Gaddes has written is unique in that it is the first of its kind to relate neuropsychology and special education in a multidisciplinary approach, in a manner that can be useful for teachers, school psychologists and medical doctors.

The foreword, by noted authority in the field of learning disabilities Dr. William M. Cruickshank, of the University of Michigan, states "This book contains within its covers elements that are basic to the learning of all children. Until educators incorporate them thoroughly into their understanding of the total educational process, the needs of children will not be adequately served. The emphasis in this book is not on how to teach arithmetic, reading, or spelling, but on the basic neurological ingredients that make such learning possible. It is the considered opinion of the undersigned that this is one of the most fundamental books to have appeared in the lengthening list of those concerned with the field of both general and special education. It is a keystone in the professional library and in the growing literature on learning disabilities."

The first printing of the book is 25,000 copies, very large for a text of this type. Released at the end of August, it is selling in bookstores for \$30, and has been adapted as a text at the University of Georgia for courses in the neuropsychology of teacher training.

Many of the 45 graphics in the text, including the cover diagram of the simplified auditory circuits of the brain, are by Bill West of the UVic Theatre Department, whom Gaddes has known for many years.

The 11 chapters of the text address topics such as the nervous system and learning, perceptual disorders, sensory and motor pathways and learning, cerebral dominance, handedness and laterality, language development, aphasia, and dyslexia, the neuropsychological basis of problems in writing, spelling and arithmetic, remediation, therapy, and some professional problems in the field of neurology and behaviour.

The book informs the reader how to use neuropsychological information to devise

treatments for children with learning problems, and presents detailed case histories.

Gaddes worked actively on the book for 12 years before he signed the publishing contract with Springer-Verlag in 1979. As he had retired from active teaching at UVic in the spring of 1978, Gaddes was able to concentrate on the editorial rewriting of the book throughout 1979, while carrying on an active 'retirement' schedule of conference speaking engagements, research and occasional teaching.

'Not your alleged unemployed Ph.Ds.'

Pioneer researcher and author in the field of neuropsychology and UVic Professor Emeritus Dr. William Gaddes (see story this page) has seen greatly increased interest in the field of neuropsychology during the 1970s, but he says there is still a great need for more highly-trained people in this field.

UVic offers a Ph.D. in neuropsychology through the Psychology Department, but most psychology departments at other universities still don't teach neuropsychology, Gaddes said during a recent interview in his office in the Cornett Building.

Neuropsychology did not exist as a formal field of study in the Thirties when Gaddes was teaching elementary school in the Okanagan and encountered children with learning disabilities.

Gaddes became interested in the effects of brain damage in 1945 when he was stationed in the army huts on the present UVic Gordon Head campus as a clinical psychologist involved in processing more than 5,000 prisoners of war, some of whom had suffered brain injuries.

Neuropsychology is still not being taught to enough people, partly because there are not enough people around to teach it, Gaddes says.

"Trained neuropsychologists are snapped up. They are not the alleged unemployed Ph.Ds. Our grads have a choice of jobs."

CALENDAR

Friday, October 24th.

- Maltwood Gallery. Victorian Silver exhibit. Gallery hours are 10:00 a.m. to 4:00 p.m. Monday to Friday and during evening events in the University Centre Auditorium. Continues until Nov. 10.
- 12:30 p.m. Free public lecture sponsored by the French Department. Professor Henri Mitterand, University of Paris will speak on "La semiotique de l'espace romanesque". CLER D132.
- 12:30 p.m. Fridaymusic. Free noonhour brass concert. MUSIC BUILDING, RECITAL HALL.
- 3:30 p.m. Faculty Association meeting. CORN 163.
- 7:15 p.m. Cinecenta films. Double feature. *The China Syndrome* and *Dr. Strangelove*. Admission charge. SUB Theatre.
- 8:00 p.m. "The International Band", University of Victoria Wind Symphony, Jesse Read, conductor, and the Island Quintet perform works by Badings, Willan, and Grainger. UNIV Auditorium. No charge.
- 8:00 p.m. Master Degree Recital. Ray Still, oboe and woodwind seminar, no charge. MUSIC BUILDING, RECITAL HALL.

Saturday, October 25th.

- 7:15 p.m. Cinecenta films. Double feature. *The China Syndrome* and *Dr. Strangelove*. Admission charge. SUB Theatre.
- 8:00 p.m. Master Degree Recital. Ray Still, oboe and woodwind seminar. No charge. MUSIC BUILDING, RECITAL HALL.
- 9:00 p.m. "The Caribbean Carnival of Trinidad". Tickets are \$7.50 and \$9.50, with \$1. off for students and senior citizens. UNIV Auditorium.

Sunday, October 26th.

- 7:15 p.m. Cinecenta films. *Time After Time*. Admission charge. SUB Theatre.
- 9:15 p.m.

Monday, October 27th.

- 12:30 p.m. Free public lecture sponsored by the UVic Christian Science Organization. John M. Tyler, Christian Science Board of Lectureship will speak on "Spiritual Man Discovered". CLER A201.
- 4:30 p.m. Oral Examination. William S. Thackray, M.A. candidate in History will defend his thesis entitled: "Keeping the Peace On Vancouver Island: The Colonial Police and the Royal Navy, 1850-1866". CLER C118.
- 7:15 p.m. Cinecenta films. *To Forget Venice*. Admission charge. SUB Theatre.
- 9:15 p.m.

- 7:30 p.m. Faculty Club meeting. Faculty Club.
- 8:15 p.m. University Extension Association meeting. Dr. Jeremy Wilson, Department of Political Science, will speak on Campaigns and Meta-Campaigns: The 1980 American Presidential Campaign as Depicted by the Media. ELLI 168.
- 7:30 p.m. Free public lecture sponsored by the Canada-China Friendship Association and the UVic Oriental Studies Association. Dr. Jan Walls, Centre for Pacific & Oriental Studies, UVic, will speak on "Modern Chinese Media", current Chinese radio, TV and magazines. CLER C108.

- Tuesday, October 28th.
- Wednesday, October 29th.
- 7:00 p.m. Cinecenta films. *The Ceremony*. Admission charge. SUB Theatre.
- 9:15 p.m.
- 8:00 p.m. Awards Recognition Ceremony with reception to follow in lobby. UNIV Auditorium.

Thursday, October 30th.

- 7:00 p.m. Cinecenta films. *The Wanderers*. Admission charge. SUB Theatre.
- 9:15 p.m.
- 7:30 p.m. Second forum in a series of three public forums sponsored by the

Alumni Association and the University Extension Division, covering subjects of contemporary concern: Inflation, Stress, and Energy. Topic tonight is Stress — How to Deal With Stress Whether You Are Busy Or Not. Price is \$3. per forum. UNIV, Senate Chambers.

Friday, October 31st.

- Last day for dropping first-term courses without penalty of failure.
- 12:30 p.m. Fridaymusic. Free noon-hour percussion concert. MUSIC BUILDING, RECITAL HALL.
- 12:30 p.m. Free public seminar sponsored by the English Department. Dr. Tom Cleary will give an informal talk on the topic: "Pope, Swift, and Some Late Baroque Paintings. CLER C216.
- 3:30 p.m. Faculty of Graduate Studies meeting. CORN 108.
- 7:00 p.m. Cinecenta films. Werner Herzog's *Nosferatu*. Admission charge. SUB Theatre.
- 9:15 p.m. University of Victoria Ensemble, UVic Sonic Lab, John Celona, conductor. MUSIC BUILDING, RECITAL HALL. No charge.
- 8:00 p.m.